

# MUNICIPAL DEPARTMENT

## WATERWORKS SYSTEM FOR PETROLEA.

The town of Petrolea, Ont., has for years suffered from an insufficient supply of water, the townspeople buying their supply in the same manner as milk is purchased from the dairyman. This supply was obtained from a spring water well in the vicinity, and was sold at one cent per pail. The average family purchased two pails per day, which cost an average of \$7.30 a year.

During the past summer, however, there has been in course of construction a complete system of waterworks, under the supervision and from the plans of Mr. Willis Chipman, C. E. The supply is obtained from Lake Huron, about twelve miles away, at a point about nine miles east of the mouth of the St. Clair river, and the water is stated to be very pure. From the London Free Press the following particulars of the system are obtained:

The point near where the intake is laid is known as Perch station, where the pumping station and the pumping engineer's residence have been erected.

From Perch to Petrolea is a distance of sixteen miles by the road. Following the pipe line through fields and orchards and woodlands the distance is slightly more than 58,000 feet, or eleven miles.

The pipes have been laid upon a direct line the whole distance, save at a point near the London road, where a heavy bit of cutting is avoided by taking a small circuit. The heaviest cutting made is over fifteen feet, while the average depth is six feet. Practically no rock is encountered. When the loam was removed, the shovellers found everywhere a light blue clay. In places the clay is very hard, requiring constant picking, often coming out in chunks like rocks. But, after all, it is easier to handle than big stones, and the contractors have rushed the work through in a commendable way.

Never were many more than one hundred men employed on the trench. It was not necessary to employ a larger force, because the pipes would then have been ready far in advance of the pumping station and other necessary equipment.

The principle upon which it is proposed to take the water from the lake to the town is very simple. The intake pipe lies on the bottom of the lake eleven hundred feet from shore, and well protected by piles. The lake bottom splendidly suited for the purpose. It inclines very gradually the whole distance. Only near the shore had dredging to be done, which was accomplished with the aid of a homely affair, constructed on the spot—a sort of amphibious animal that could float or travel on wheels. Homely as it appeared, the rudely-constructed affair did its work well, and has now taken up a position on the shore where to watch the progress of the men who are busily engaged sinking the intake line. This work was not pursued without difficulty. One day a pipe was being carried out to be placed in position when a sudden gust of wind from an unexpected quarter caught the craft upon which the

pipe was resting and dumped the latter into the lake in eleven feet of water.

Happily, however, it will not be necessary to lay the intake in any great depth of water. So gradually does the hard clay bed of the lake recede from shore, at a distance of 1,100 feet the depth is only 14 feet. At the end of the intake pipe a strainer will be placed. This is a heavy iron tank, about four feet in diameter and circular in shape. It will be placed upon one end, and close to the bottom the intake pipe will be connected with it. Surrounding the lower part are no entrances for the water; a door is inserted for purposes of cleaning out. But the upper half of the affair is perforated with holes an inch in circumference, through which the lake water will rush to the intake. This arrangement is provided to keep out obstacles of ice and sand which might otherwise be sucked into the pipe.

Mr. Chipman has devised a capital idea for cleansing the intake pipe. By filling the water tower in town and then suddenly letting it go lakeward the whole system will be flushed out.

The water flows through the intake pipes of its own accord to a well constructed at the front of the pump-house. But apparatus will also be constructed whereby, should the water not flow rapidly enough, it may be pumped into the well. The well is solidly walled with brick and has a depth of 30 feet, ten or twelve feet below the lake level. It is fifteen feet in diameter. A peculiarity noticed in the construction of the well was, that while it was taken away below the lake level, and not over 100 feet from shore, the clay was so dry water had to be thrown in to moisten it.

The next important feature of the system is the pumping station. The station is connected with the well—both under one roof. It is a long building, with a rather low elevation, but solid-looking. The actual dimensions of the pump house are 100 x 30 feet. A massive brick chimney seventy-five feet high is erected at one side of the building, and between the front and the rear. The pumping station comprises the well, pumping station, engine and boiler room and shed.

The engine room is 44 x 30 feet, and is excavated to a depth of ten feet below the level of the earth. This was done in order to give the engines as little "lift" from the lake as possible. The interior walls are "pointed" black, and around them, and overlooking the machinery, a gallery will be placed for the use of visitors. At the rear of the engine room the boilers will be placed, and after this is a commodious coal shed. Forkin & Simpson, of Sarnia, built the pumping station and the engineer's residence, and R. Clark & Son, of Petrolea, built the engine and boiler foundations.

The pumping engines were contracted for by a Cleveland firm, but the contract for the larger, or "high duty" engine, was sub-let to the London Tool Company. The "high duty" engine will be used almost entirely until both are required. The other engine will be a duplex, and each will have a capacity of one million gallons per day. But the high duty engine possesses the advantage of being a large coal saver.

Two immense boilers, capable of developing 200 pounds of steam each, will be utilized. They are being manufactured at the Stevenson Boiler Works, Petrolea.

Leaving the pumping station, the rather unique system takes a cut across country for its destination—Petrolea. The pipes are of cast iron, and were made by the Gartshore-Thomson Co., of Hamilton. This force main is 12 inches in diameter, and capable of carrying an immense volume of water. The main leaves the pumping station at a depth of about six feet, and very soon arrives at Perch Creek. Then comes Deer Creek, and a

few miles further on is Cow Creek, and before Petrolea is reached Bull or Stonehouse Creek have to be overcome—or, rather, undercome, for the main goes beneath the bed of each stream. The old idea of carrying a pipe over a creek or larger stream has long since been left behind in the rapid march of modern engineering. The force main is also taken beneath two railway tracks, the main line of the Grand Trunk and the Great Western Division.

Thirty-nine farms are crossed, and sixty taps have been placed along the line for the use of farmers, who will, of course, pay for the water perhaps at the same rate as the residents of Petrolea.

The height of land is reached about four miles from Petrolea, on the Denver farm. To and from this point the mains are graded.

Petrolea is entered by way of Centre street, and at a distance of probably 600 feet north of Main street and just off Centre street the circular water tower will be erected. When fully "loaded" the tower will weigh 1,200 tons. This enormous weight will be borne by a foundation of solid masonry and Canadian Portland cement, running over eighty feet into the ground. The water will enter from below, and be forced to the top of the tower, 85 feet. The tower is to be constructed of the very best "mild" iron. The iron will be put into the tank in great sheets, and so fine is the quality of the metal, it will bend double without cracking or breaking.

The tower is not intended to furnish a fire supply, except in the case of small fires. It will give all the necessary force, however, for the domestic supply of the whole town.

In the case of a large fire water will be pumped direct from the station at the lake. A telephone line is already constructed from the town to the lake shore, and by this means the pumping engineer will be notified.

Practically the whole town will have the water at its door. The original contract for pipe for town distribution was 38,000 feet, in addition to 10,000 feet purchased from the private company which failed in an attempt to establish a waterworks system for the town a few years ago. Then six to ten thousand feet more will be laid at once, or a total of 58,000 feet—the same length as is the force main. The mains through the town are exceptionally large, so as to avoid friction as far as possible. The fire hydrants are of the same substantial nature as characterizes the whole system. Each hydrant weighs one-third of a ton, and is fitted with two ordinary branches, and a third large one, the latter being for the purpose of attaching a fire engine and pumping water from the main in the event of insufficient force. A valve is also supplied whereby the hydrants may be repaired without cutting off the water from the main.

Garson & Co., of St. Catharines, have the contract for pipe-laying and building the system throughout, with the exception of the machinery at the pumping station, and their contract price was \$132,000. Their tender was the lowest of eighty-two received, but so close was the figuring that the highest tender was only \$154,000. The pumping machinery will cost \$14,500. Other items of expenditure, but included in the Garson contract, are \$1,500 for the pumping engineer's residence at the lake; \$7,000 for the pumping station, and \$10,000 for the steel water tower.

The total cost of the system will be between \$160,000 and \$180,000. The sum of \$172,000 was appropriated for the purpose by by-law.

Mr. Chipman strongly urges the adoption of meters by the town, and should his proposition be carried out, Petrolea will be the first town in Canada to possess meters upon every service,